Claims

1. Method for preventing the formation of oil-in-water and/or water-in-oil emulsions and/or for breaking up emulsions already formed, comprising

a) adding tensides, materials for increasing viscosity, industrial surfactants, and microorganisms capable of breaking down crude oil components or derivatives and producing at least one type of tenside, to the emulsion already formed or into the device containing the crude oil in which the formation of the emulsion to be prevented, optionally together with additives required for the reproduction of said microorganisms;

b) providing an appropriate temperature for the microorganisms after the addition of the materials in step a);

c) allowing the microorganisms to reproduce and act for a predetermined period of time;

d) checking the results of the treatment; and

e) optionally repeating steps (a) to (d) at least once more, preferably at least three more times.

2. The method according to claim 1, wherein the said microorganisms and additives are used at the same time, in the form of an aqueous suspension.

3. The method according claim 1 or 2, wherein the suspension of microorganisms contains 10^6 to 10^{12} CFU/liter, preferably 10^7 to 10^{11} CFU/liter, more preferably 10^8 to 10^9 CFU/liter.

4. The method according to any of claims 1 to 3, wherein the volume of the suspension is 100 to 1000 liter/100 m pipe-length or 50 m^3 production, preferably 300 to 800 liter/100 m pipe-length or 50 m^3 production, more preferably 500 to 600 liter/100 m pipe-length or 50 m^3 production.

5. The method according to any of claims 1 to 4, wherein the volume of the industrial surfactants is 1 to 10 liter/100 m pipe-length or 50 m^3 production, preferably 1 to 5 liter/100 m pipe-length or 50 m^3 production.

6. The method according to any of claims 1 to 5 for preventing the formation of emulsions, wherein in step d) the results of the treatment are checked by confirming the presence of a film on the surface in contact with the crude oil which provides for the living conditions of the said microorganisms and contains the said microorganisms, and optionally steps a) to d) are repeated by changing the parameters, preferably by changing

the amount of the tenside or material capable increasing viscosity, or by varying the reproduction time of microorganisms.

7. The method according to claim 6, wherein the formation of emulsion is prevented in oil-producing pipes of oil wells.

8. The method according to claim 6 or 7, wherein the microorganisms are allowed to reproduce and act for 1 to 15 days, preferably 6 to 8 days, while the pipes are kept closed.

9. The method according to any of claims 6 to 8, wherein the results of the treatment are checked by pilot test and/or by confirming the phase separation and/or evaluating the physico-chemical properties, preferably the decrease of viscosity of an oil sample and/or evaluating the drop-size of the asphaltene-paraffin-vax precipitates in an oil-sample by microscopy.

10. The method according to any of claims 6 to 9, wherein the asphaltene-paraffin-vax precipitates are removed from the surface in advance by mechanical means.

11. The method according to any of claims 1 to 5, wherein emulsions already formed in surface producing facilities of oil wells, or highly stable middlephase formed in demulsification facilities of oil producing technologies are broken up.

12. The method according to claim 11, wherein the microorganisms are allowed to reproduce and act for 1 to 15 days, preferably 5 to 8 days, while the devices are kept closed.

13. The method according to claim 11 or 12, wherein the temperature is kept between 20 to 60 °C, preferably between 40 to 50 °C.

14. The method according to any of claims 11 to 13, wherein the results of the treatment are checked by evaluating the physico-chemical properties, preferably the decrease of viscosity of an oil- and/or water-sample, and/or evaluating the drop-size of the asphaltene-paraffin-vax precipitates in an oil-sample by microscopy.

15. The method according to any of claims 1 to 14, wherein the surfactant is selected from the group consisting of polyoxyethylene ethers and esters, and mixtures thereof, preferably Tween 80.

16. The method according to any of claims 1 to 15, wherein the material capable increasing viscosity is xanthan.

17. Use of a microorganism capable of breaking down crude oil components or derivatives and producing at least one type of tenside for preventing the formation of oil-in-water and/or water-in-oil emulsions and/or for breaking up emulsions already formed.

18. The use according to claim 17, wherein prevention of the formation of emulsions is carried out by the formation of a bacterium-carrying film on the surfaces in contact with crude oil.

19. The use of claim 17 or 18, wherein the microorganism is a strain belonging to the *Bacillus subtilis* species, the *Bacillus cereus* species, the *Pseudomonas* genus or the *Xanthomonas* genus, and is preferably facultative anaerobic.

20. The use according to any of 17 to 19, wherein the microorganism strain is obtainable by the following selection method:

i) applying a film comprising the mineral oil component or derivative to a minimal medium lacking carbon source,

ii) inoculating this medium with a sample comprising a mixture of microorganisms said sample being obtained from an oil pollution, and incubating the medium after inoculation at least till detectable microorganism colonies are formed, if the formation of colonies does not occur within an arbitrarily defined time period step i) and present step ii) are repeated,

iii) decomposing activities of the microorganism from the colonies formed are tested at the surround of the colonies and

iv) tenside producing abilities of the decomposing microorganisms obtained from the colonies are checked.

21. The use according to any of claims 17 to 20, wherein the microorganism is selected form the group consisting strains NCAIM (P) B 1304, NCAIM (P) B 1305, NCAIM (P) B 1306, NCAIM (P) B 1307 and NCAIM (P) B 1308 deposited on April 17, 2002 at NCAIM, or any strain derived therefrom, and preferably is a strain that is genetically modified, more preferably modified by the insertion of a DNA fragment with a known sequence as a marker.

22. Kit for preventing the formation of oil-in-water and/or water-in-oil emulsions and/or for breaking up emulsions already formed, comprising a microorganism useful in the method of claim 1, further comprising instructions to carry out the method of any of claims 1 to 16.

23. The kit according to claim 22 comprising one or more of the microorganisms defined in any of claims 17 to 21 and additives necessary for the reproduction thereof.

24. The kit according to claim 22 or 23 further comprising a surfactant and/or a material for increasing viscosity.